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MASTEP Technology Review

Technology Name: Vegetative Filter Strips - Ryegrass

Studies Reviewed: Sediment Removal Efficiency of Vegetative Filter Strips. B. Gharabaghi, R.P. Rudra, H. R. Whiteley, W. T. Dickinson. Guelph Turfgrass Institute 2000 Annual Research Report. 2001.

Date: May 21, 2010

Reviewers: Jerry Schoen

Rating: 2

Brief rationale for rating:

This study, conducted in the field using simulated rainfall/runoff, was generally well conducted. Quality control data is lacking. Summary removal efficiencies were reported; data for each test run was not provided.

Comments

- Simulated runoff flowed through vegetated filter strips of varying lengths.
- Filter strips contained ryegrass (*Lolium perenne* L.).
- 58 storm simulations were run, approximately 6 samples collected per run.
- Influent and effluent sediment concentration were tested but not reported. Study did state that correlation between influent sediment concentration and removal efficiency is weak.
- 4 different flow rates were tested: 0.25, 0.54, 0.80, and 1.67 liters/second.
- Strip lengths of 2.44, 4.88, 9.67 and 19.52 meters were tested. About 50% of sediments were removed within the first 2.5 m of the filter length (for all flow rates) and an additional 25% to 45% (depending on flow rate) of sediments were removed within the next 2.5 m of the filter length. The sediment removal efficiency of the filter strip did not increase much for increases in strip length beyond 10 meters.
- Sediment size analysis was conducted on influent and effluent sediments. Six aggregate size ranges were selected, (0.5-2.9), (2.9-6.4), (6.4-12), (12-39), (39-68), and (68-151) microns. The sediment removal efficiency was calculated separately for each aggregate-size range. Sediment removal efficiency patterns were almost identical for the first three aggregate size ranges. More than 95% of the aggregates larger than 40 μm were removed within the first 2.5 m of the filter strip length. The only mechanism that helped in the removal of the smaller-size sediments was infiltration.